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## But Don't Call It "Industrial Policy"

## Bush Shows Election-Year Concern for Civilian R&D

In a feat of election-year alchemy, George Bush and associates are repositioning themselves as champions of high-tech industry and civilian research, after three years of waffling, confusion, and fighting among themselves about the appropriate federal role in these areas.

Unalloyed commitment to the public interest may account for the transition. But it must be noted that it coincides with low ratings for the President's domestic performance, particularly on economic matters, and Bill Clinton's promise to create a civilian research agency to boost industrial technology.

On March 20, Presidential Science Adviser D. Allan Bromley called a press conference on short notice to announce a study aimed at formulating a multi-agency Presidential Advanced Manufacturing Initiative, to conduct research on manufacturing techniques. Federal assistance for manufacturing R&D has long been advocated by Congressional Democrats and shunned by the White House as a kind

of career potential. However, the Administration's reversal on the CTI was made without explanation, suggesting the triumph of appearance over policy.

Meanwhile, using the overblown title of The National Technology Initiative, the Commerce Department has been staging meetings around the country to acquaint industry and business with the research capabilities of the government's inhouse laboratories, many of them relics with expired missions and no justification for their costly longevity.

Even Bromley publicly acknowledges that some of the labs, unnamed, have outlived usefulness. A decade of efforts to promote links between federal R&D facilities and

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## **Gallo "Absolved" by NIH—P. 5** **Academy Ducks Misconduct Role—P.6**

of "industrial policy"—which ranks just short of Marxism in the Bush lexicon of economic sins.

Bromley emphasized that he was merely making public note of a planned study which, if approved by the President, would ascend to the prestigious status of a Presidentially endorsed Initiative. But the White House was eager to go public with even that meager item. Bromley has since announced a change of title, from Advanced Manufacturing Initiative to 21st Century Manufacturing Initiative, to avoid any suggestion, he explains, of "retardation in manufacturing."

Last fall, in a complete turnaround, the Administration welcomed the Congressionally created Critical Technologies Institute (CTI), six months after declaring CTI unnecessary and sending back the money appropriated by Congress [SGR, January 15]. The CTI is supposed to identify and plot strategies for keeping the US No. 1 in embryonic technologies that may be crucial for industry and defense. The utility of the new agency is debatable. The original rejection may well have been appropriate, given that the Washington technology scene is littered with busybody kibitzers, official and self-appointed, and the compiling of critical technolo-

## In Brief

Striving to overcome his vapid image, Vice President Dan Quayle has been staking out technological and medical areas for low-risk leadership, initially in space, now in cancer. At Quayle's request, a Special Commission on Breast Cancer has been established by the President's Cancer Panel, the top advisory body of the National Cancer Institute. The first meeting, May 28 at NIH, is scheduled to open with remarks by Mrs. Quayle.

*White House Science Adviser D. Allan Bromley has announced a study of the health of academe, a followup to the report he collaborated on with David Packard in 1985. With Princeton President Harold Shapiro as Vice Chairman, Packard will chair the study for the President's Council of Advisers for Science and Technology.*

NIH Director Bernadine Healy, asked April 7 at a House Science Subcommittee hearing for her views on priority-making, gave 'em an earful: "I personally, to be perfectly blunt, don't think we have right now a mechanism within the Executive Branch that adequately looks at all of the priorities in an open and robust and table-thumping way.... There is not an opportunity to sit around a table, with all of the agencies there, letting it hang out, saying, 'Let's look at SSC, let's look at the Space Station, let's look at NIH, let's look at NSF....'"

*Carrying on a sexist tradition that would shame a redneck beer club (and probably land it in court), the National Academy of Sciences has just conducted its annual elections. Results: 54 new boys elected by the old boys, thus bringing the male count to 1581. The Academy also elected 5 women, raising the female contingent to 70.*

## ... Sununu's Departure Opens New Opportunities

*(Continued from Page 1)*

industrial firms has produced sparse results, suggesting that the two were not destined to tango. But in the quest for opportunities to appear solicitous about industry, the Administration takes what it can find, particularly if the costs are low.

The Administration's industrial pirouette appears to be driven by the same force that impelled Mr. Bush to embrace health-care reform last November—after three years of inactivity that was excused on the grounds of the need for more study of what is by far the most studied issue on the public agenda.

The conversion in that instance was proclaimed immediately after Harris Wofford, the Democratic underdog, rode the health issue to victory in Pennsylvania's special election for the US Senate. Immediately upon learning the outcome, Mr. Bush, visibly shocked, postponed a long-planned visit across the Pacific to devote himself to the failings of the health-care system.

The Bush Administration has been of several minds on the issue of government support for civilian research and high-tech industry. The official line, repeatedly enunciated by Bromley, is that it's okay for the federal government to support "precompetitive" and "generic" research. But anything beyond that would cross into "industrial policy," and make Washington bureaucrats responsible for "picking winners" in competitive markets—unacceptable to right-wing ideologues. Until his ignominious departure last December, the Administration's dominant figure on this issue was John Sununu, the White House Chief of Staff, who unfailingly performed as a determined opponent of a wider government role in civilian technology and industry.

Holding a PhD in engineering, Sununu regarded himself as peerless in industrial matters. And, in alliance with Richard Darman, Director of the Office of Management and Budget, and Michael J. Boskin, Chairman of the Council of Economic Advisers, Sununu held the line against attempts to apply broad interpretations to "precompetitive" and "generic." Within the federal bureaucracy, Sununu, the standin for a President uninterested in domestic affairs, decreed sudden death for violators.

Sununu wielded wide influence on this issue, as on many others. His stiletto has been identified by the General Accounting Office in the first public explanation for the elimination of an ambitious Defense Department program to monitor industrial technology in nations around the world. Known as Project SOCRATES, the snoop system began in 1984, appeared to thrive, and then languished and finally died in 1990. GAO attributes its demise to "high level executive branch officials [who] felt that the project's reports were trying to promote an 'industrial policy' that they did not endorse." The contents of the reports were not revealed but it may be speculated that they suggested US responses to innovative technological developments abroad.

Two years ago, opponents of an expanded civilian R&D role for government claimed an improbable victim, Craig Fields, the highly regarded Director of the widely idolized Defense Advanced Research Projects Agency. DARPA long has been at liberty, under the mantle of defense necessity, to pump money into individual firms and products. Operating with little Congressional or press scrutiny, the \$1.5-billion agency has, in fact, functioned as this country's version of what elsewhere is called the Ministry of Technology. Congressional Democrats often sigh at the example of DARPA and pine for a civilian ARPA.

Fields, however, violated Sununu's ideological line by invoking an obscure statutory provision that permits the Defense Department to take an equity position to shore up firms that are considered essential for national security. Learning that Fields intended to come to the rescue of a small California electronics firm that, in desperation, had turned to Japan for financial assistance, Sununu engineered Fields' instant ouster as chief of DARPA.

Sununu's abhorrence of "industrial policy" also led to the departure of Deputy Secretary of Commerce Thomas J. Murrin, who tried to implement Congressional mandates for the Commerce Department to enlarge its role in civilian technology. Frustrated in his efforts, Murrin went off to become Dean of the School of Business and Administration at Duquesne University.

Where Bromley stands on these matters is a subject of some debate, since, on the public record, he devoutly follows the Administration line against "industrial policy" and trying to "pick winners," and so forth. But, in Washington science-policy circles, there are those who claim to observe winks and nods by the President's Science Adviser, suggesting, they claim, that Bromley is more of an industrial interventionist than he openly lets on.

After Fields was removed from DARPA, Bromley publicly insisted that a well-deserved promotion, rather than an ideologically induced ouster, had taken place. On the other hand, after Murrin left the Commerce Department, Bromley

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## ● The Bromley Reverse on Critical Technologies Institute

*The following excerpts are from a tape-recorded interview SGR held September 10, 1991, with Presidential Science Adviser D. Allan Bromley, Director of the Office of Science and Technology Policy [OSTP], concerning the Critical Technologies Institute, which is supposed to devise strategies for assuring a US lead in hot technologies. Created by Congress, and directed to work closely with OSTP, the CTI was rejected by the White House last summer as a devious device for pursuing "industrial policy"—the boogeyman of Bush economic nightmares, especially abhorred by John Sununu, then in his final months as White House Chief of Staff.*

**Q. Where does the Critical Technologies Institute stand?**

**Bromley.** We have recommended to Mr. Darman [Director of the Office of Management and Budget], who, in turn, recommended to the Congress, that....there be a revision of that funding. We did that after a lot of study, a lot of work. We finally came to the somewhat reluctant conclusion that, in fact, the way we had originally intended to put this together was not going to work. That, because of the mix of policy and science activities that goes on in this office [OSTP], that to bring in a group that was half government

*Rebuffed by the White House, Senator Bingaman revived the CTI proposal last November in a Defense Authorization amendment that retained the original purpose but designated the National Science Foundation as the "sponsor" of the new agency, though with CTI still closely associated with the White House Science Office. Meanwhile, in December, the long-tottering Sununu stepped down from his White House post.*

From the audience, question to Bromley at the AAAS Science and Technology Colloquium, April 16, in Washington:

**Q. Dr. Bromley, it appears that there will be a Critical Technologies Institute. And I wonder if you would say a few words about how you foresee using that Institute and what its contributions to science and technology policy might be.**

**Bromley.** The first meeting of the Operating Committee of the Critical Technologies Institute, which I chair, was held yesterday, as a matter of fact....

What will it do? It will do several things. First of all, the Congress ... has spelled out a whole series of tasks for us. Secondly, we want to use the convening power of the Institute to bring together private-sector groups to work with the FCCSET [Federal Coordinating Council for Science, Engineering, and Technology] committees working in various areas. It's extraordinarily difficult, given the conflict-of-interest regulations, and the way they're interpreted by generations of ever-more-nervous lawyers, to bring together private-sector and government scientists to work on any-

and half non-government was going to create so many problems of a legal and other nature, on the one hand, that it was going to be extremely difficult to manage. And, on the other hand, we recognized that we were already doing a substantial amount of what Senator Bingaman [D-New Mexico, sponsor of the CTI legislation] and others, who really have the very best interests of the country at heart, have wanted done, within the existing mechanism. And we will do more of that....

**SGR. What you're recommending is that there be no Critical Technologies Institute.**

**Bromley.** That's correct....

**SGR. That activity is just sort of naturally encompassed in this office [OSTP] in the normal course of events?**

**Bromley.** It is.

**SGR. You would not like to see a separate organization.**

**Bromley.** That's where we get out....

**SGR. I don't detect that there would be any enthusiasm in doing it.**

**Bromley.** We have so much to do and we have so few people to do it that we have come to the conclusion that we can do the best job for the President and the nation by not developing an independent structure.

thing. And the Critical Technologies Institute provides a marvelous mechanism for doing that....

Our intention is not to focus on technology push but rather on the pull that will be exerted by these national problems. The important aspect of the Institute is that for the first time, it gives us a structure within the Executive Office of the President that allows us to have people do long-term strategic thinking, which is essentially impossible in the brushfire, crisis atmosphere that much of our activity takes place. So, this I think will be a very important activity and part of its success will rest on the extent to which it turns out to be useful not only to my office but to all the offices of the White House.

So, I'm delighted to have this now essentially under way, and we have an enthusiastic Operating Committee of very senior members of the government. And it's under way.

## NIST Makes 27 New Awards

The Advanced Technology Program at the National Institute of Standards and Technology is growing robust, after near-suffocation in the cradle during the Reagan Administration and early neglect by the Bush Administration. Designed to assist industry in the development of advanced technologies, ATP has just announced a total of \$25 million in first-year awards for 27 projects involving 80 companies, universities, and research organizations. ATP is budgeted for \$50 million this year; \$68 million has been asked for '93.

## ... Clinton Advocates Creation of a Civilian DARPA

(Continued from Page 2)

arranged for his membership on the 13-member President's Council of Advisers on Science and Technology, the supreme advisory body in government S&T affairs.

While Sununu reigned at the White House, it is doubtful that Bromley could have gone public with a study to formulate a government program for research on manufacturing. The previous rigidity of the ideological line was illustrated last May when the *Wall Street Journal* reported that the industrial interventionist camp was gaining strength in White House circles.

"While stoutly denying that it is in the business of picking technological winners and losers," the *Journal* reported, "the Bush Administration is beginning to do just that." The article, by Bob Davis, noted that "Mr. Bromley, a former Yale physicist who is a friend of the president, has played a big role in shifting the administration's attitude toward commercial technology."

Crediting Bromley with formulating the concepts of "precompetitive, generic technologies," the article added: "Robert Costello, the Pentagon's acquisitions chief under President Reagan, says Commerce and Defense Department officials are even helping him devise a plan to transform the Commerce Department into the Department of Science, Industry, and Trade. He sees the new department as a hotbed of industrial policy—it would plot technology strategy, fund commercial research projects and force the government to buy high-tech products the department backs—but his allies want him to tone down the rhetoric. 'They want me to go to the White House and see if I get my head chopped off,' Mr. Costello says."

Four days later, the *Journal* reported that Bromley had emphatically denied the first account following criticism by Sununu, Darman, and Boskin "for contributing to public misunderstanding of President Bush's position on industrial policy."

The statement attributed to Bromley said: "The Bush administration's basic policy principles in this area were stated clearly during the 1988 campaign and have been unchanged since. These principles," he continued, "are inconsistent with an industrial policy of targeting particular industries for support or particular technologies for commercialization."

While the Bush Administration stumbles toward a larger federal role in civilian R&D and technology, Clinton is rhetorically out front on the issue with proposals that go beyond "precompetitive" and "generic" and call for massive additional R&D spending aimed at commercial goals.

In a speech to the Wharton School of Business on April 16, Clinton said: "Every dollar we take out of military R&D in the post-Cold War era should go to R&D for commercial technologies, until civilian R&D can match and eventually surpass our Cold War military R&D commitment."

Clinton continued: "We should create a civilian research

### Help for High-Tech Industry

From a speech by Frank Press, President of the National Academy of Sciences, April 27 at the NAS Annual Meeting.

The large federal investment in the "D" part of "R&D" provides relatively little support of emerging, pre-commercial technologies important to the civil sector. One reason is the reluctance on the part of political leaders to support anything that smacks of "industrial policy"....

The fact that several advanced democracies have successfully introduced policies to improve their competitive position should soften our trepidation....

The Administration has begun to support some changes in our technology policy. It is backing innovative approaches to manufacturing technology extension centers and the Advanced Technology Program administered by the National Institute of Standards and Technology.

[A recent Academy report, *The Government Role in Civilian Technology: Building a New Alliance* (SGR, April 15) recommended creation of] a quasi-public "Civilian Technology Corporation," managed outside the government by a private board appointed by the President and approved by the Senate. The CTC would be funded by a one-time appropriation of \$5 billion for a five-year period. It has been suggested that these funds ... might be found within a small reallocation from the \$23 billion budgeted annually for the more than 500 federal laboratories. Many of these laboratories have reduced or vanishing missions in light of changing world conditions.

and development agency to support research in the dozen strategic technologies that scientists have already identified as the basis for launching new growth industries over the next two decades and revitalizing traditional ones.

"The civilian DARPA will coordinate R&D to help companies develop innovative technologies and bring new products to market. And without inhibiting the competition that drives innovation," Clinton went on, "we will encourage and promote collaborative efforts among firms and with research institutes for commercial development just as we have done with defense technologies for 40 years."

Look for the Bush Administration to match those proposals. Reactive rather than innovative, Mr. Bush is propelled by threats and risks. The danger he faces in the field of civilian technology is that his political foes have embraced ideas that Bush and associates have tried to squelch for three years. But the Presidential camp is nimble and immune to embarrassment, and can quickly change.—DSG

## ● NIH Report Assails Gallo's Behavior But Clears Him

The word leaking out of the National Institutes of Health is that its renowned AIDS researcher, Robert C. Gallo, has been cleared of charges that he filched the HIV virus from Pasteur investigators and misrepresented his work in a landmark article in *Science* in 1984. That's the gist of a March 27 letter marked "confidential," from NIH Director Bernadine Healy to her chief up the line, Assistant Secretary of Health James O. Mason, transmitting the report, prepared by investigators in the NIH's Office of Scientific Integrity.

It is true that the report, not yet released but delivered to SGR by an attentive mole, does not tag Gallo with misconduct. That opprobrium is reserved for a former subordinate in Gallo's Laboratory of Tumor Cell Biology (LTCB) at the National Cancer Institute: Mikulas Popovic, a virologist who supposedly performed much of the work reported in the *Science* paper, of which Gallo was senior author.

Nonetheless, if the NIH report "absolved" Gallo, as Healy claims in her covering letter, it is a certainty that all scientists would prefer to be free of such absolution.

The report notes "that the NIH investigating team was not unanimous" in exonerating Gallo of misconduct, and that an outside adviser to the investigation had branded Gallo guilty of numerous departures from accepted scientific behavior. The report states that Gallo "breached his overall responsibility as head of the LTCB and senior author to ensure the accuracy of the paper. This absence of responsibility cannot be condoned."

The report states that the adviser, not identified among several senior scientists who assisted the NIH inhouse investigators, "believed that Dr. Gallo's negligent conduct in these domains, coupled with his apparent disregard in this instance for accuracy and responsibility in the conduct and reporting of research, did constitute scientific misconduct."

Though the bottom line says not guilty, the report, in fact, is scathing about Gallo's behavior, while insisting that he did not cross the line into "misconduct," officially defined by NIH as "fabrication, falsification, or plagiarism ... or other serious deviations from accepted research practices."

Citing 20 "discrepancies" in the paper, ranging from "editorial mistakes to knowing misrepresentations," the panel found Popovic responsible for 17 of them, including "misrepresentations or falsifications of the actual methodology and data." It concluded that his work reflects "a lack of respect for truth and accuracy in the conduct and reporting of scientific research."

Gallo is held responsible for three discrepancies, two concerning clarity in reporting cell cultivation, one concerning a mismatch between text and figure related to a micrograph. The report goes on to state that "20 errors in less than four pages of text of a published scientific paper is unacceptable." Noting that the authors claimed that errors were attributable to haste necessitated by the AIDS crisis, the report states that the NIH investigators "were not convinced that the speed of preparation, whatever the reason, made the

knowing misrepresentations inevitable or excusable."

Gallo's reputation as a ruthless glory seeker also entered into the NIH investigative report, which observes that the investigators "were struck by the numerous instances in which Dr. Gallo's behavior was less than collegial but decidedly beneficial to himself and his causes. Examples of such self-serving behavior include altering the scientific content of a published paper purporting to describe data previously presented orally to favor his own purposes...

"Although no individual instance of self-serving behavior was considered to constitute scientific misconduct," the NIH report continues, "the expert advisors believed that, taken together, this behavior reflects disregard for accepted standards of professional and scientific ethics. However, although these behaviors represent poor professional practice, they do not constitute scientific misconduct."

Strong exceptions to Gallo's exoneration were expressed by one of the outside advisers to the investigation, Frederic M. Richards, Professor emeritus in the Department of Molecular Biophysics and Biochemistry at Yale University. In a letter to Healy, Richards said the report's conclusions fail to reflect "a pattern of behavior on Dr. Gallo's part that repeatedly misrepresents, suppresses and distorts data and their interpretation in such a way as to enhance Dr. Gallo's claim to priority and primacy." Richards' letter went on to accuse Gallo of "intellectual recklessness of a high degree—in essence *intellectual appropriation* of the French viral isolate." Charging that there "appears to be a discrepancy in the treatment of Drs. Gallo and Popovic," Richards concluded:

"The report does not address the overriding issue of the responsibility of the Chief of a Laboratory to monitor the performance of all personnel in the Laboratory and to pay particular attention to the accuracy of major publications which bear his name as author." Popovic, he noted, "had an imperfect command of English and a known inadequacy in record keeping. The combination of these facts should have resulted in the most meticulous scrutiny by the Chief of the Laboratory...."

Healy's letter to the Assistant Secretary of Health says that "Gallo was absolved of allegations of scientific misconduct" and that "reasonable attempts must be made to clear Dr. Gallo's reputation with regard to accusations of misconduct—and also to accusations that he knowingly and willfully misappropriated a French virus, for which there is no apparent evidence."

In the camp of Rep. John Dingell, who feels Healy has eviscerated the NIH Office of Scientific Integrity, the report is rated a whitewash, a pale version of an initial draft by an investigator, Suzanne Hadley, whom Healy removed from the case. Meanwhile, Dingell's investigators are looking into whether Gallo violated requirements of truthfulness in applying for patents for AIDS blood tests that have netted him several hundred thousand dollars in royalties.—DSG

## Academy Misconduct Study Calls for More Study

After studying scientific misconduct for two years, and consuming \$888,000, a 22-member committee of the National Academy of Sciences has concluded that it's a serious but rare event that warrants no decisive action and that a special board should be created to grapple with the issue.

On the merits, the pallid report would ordinarily rate little attention. It does nothing to advance understanding about the incidence or consequences of scientific misdeeds—a poorly understood and little-researched subject that bores scientists, inflames politicians, and puzzles the public.

Throughout its long deliberations, the committee resounded with reports of more-than-ordinary squabbling and threats of minority dissents, which finally faded to a cranky "minority statement" by two members. The final product, from a mainstream group of scientists, elder statesmen, and lawyers, reeks of common-denominator committee compromise.

But coming from the prestigious Academy after a decade of scientific scandals and fiery Congressional hearings,

**Responsible Science: Ensuring the Integrity of the Research Process** (189 pp., \$24.95, plus \$3 for shipping); order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1/800-624-6242; in Washington, DC, area: 202/334-3313.

the conclusions suggest that the mandarins of science figure they've weathered the political storms. All along, the inside view has been that the fraud issue is a mirage conjured up by unscrupulous Congressmen and journalistic opportunists, and the proper strategy is to insist that the house of science is handling the problem effectively.

The conclusions, embodied in a 189-page report by the Academy's Panel on Scientific Responsibility and the Conduct of Research, were unveiled April 22 before a press audience that oscillated between puzzlement and incredulity.

While conceding that recent episodes of scientific misconduct may have impaired science's public confidence and support, the report states that "the existing self-regulatory system in science is sound. But modifications are necessary to foster integrity in a changing research environment, to handle cases of misconduct in science, and to discourage questionable research practices."

The report, however, declined to specify the modifications that are necessary, explaining that "The Panel did not have a sufficient base of institutional experience or consensus about these matters within the academic community to develop recommendations about the nature of institutional procedures for handling allegations of misconduct in science."

Even this weak brew drew a "minority statement" from two members, Howard K. Schachman, UC Berkeley, and Keith Yamamoto, UC San Francisco, who parted with their colleagues on several grounds, including that the report

"fails to convey the overriding importance of intellectual freedom...."

In defining scientific misconduct, the Panel accepted the first part of the definition currently in force at the National Institutes of Health and the National Science Foundation: "Fabrication, falsification, or plagiarism in proposing, performing, or reporting research." But it rejected as "ambiguous" the words that follow: "other serious deviations from accepted research practices." Raising the issues of fairness and the risks of faulty information, the Panel also called for abolition of the Public Health Service's ALERT system, a supposedly confidential dishonor roll of researchers under investigation. Dissenters Schachman and Yamamoto rejected the condemnation of the ALERT system as "weak."

The Panel's principal contribution to the overflowing literature of delinquency in research may well be its introduction of a new, and lesser, category of scientific sin: "Questionable research practices." These are defined as "actions that violate traditional values of the research enterprise and that may be detrimental to the research process. However," the definition continues, "there is at present neither broad agreement as to the seriousness of these actions nor any consensus on standards for behavior in such matters."

Cited as examples of "questionable" practices that do reach the level of misconduct are several ho-hum events in the life of science, such as "Failing to retain significant research data for a reasonable period" and "Maintaining inadequate research records, especially for results that are published or relied on by others."

The category of merely questionable practices then gets a bit rougher with "Inadequately supervising research subordinates or exploiting them...." The report doesn't say so but inadequate supervision can kill in the laboratory, while the exploitation of subordinates can be another term for intellectual larceny, which the panel elsewhere defines as scientific misconduct.

But then, unaccompanied by specific explanation, comes a novel addition to the list of malefactions that should not be equated with misconduct: "Misrepresenting speculations as fact..."—which seems to imply that publishing pipe dreams as firm data is a trivial departure from acceptable behavior.

Grappling with the difference between misconduct and questionable practices, the panel explained that it is sometimes difficult to distinguish them, noting that in some cases, "scientists accused of plagiarism have testified about an absence of appropriate training methods for properly citing the works of other."

That excuse, which strains belief, was not discussed further in the report, which went on to conclude that "questionable practices are not equivalent to misconduct in science, and they are not appropriate subjects for investigations

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## More IN PRINT: "Future Pebbles," Women in Science

(Continued from Page 8)

able," the report adds, "that Congress and the governmental agencies are attempting to regulate an industry of tremendous importance to the US economy in the absence of sufficient information from neutral sources on which to base such regulation."

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**Strategic Defense Initiative (SDI): Estimates of Brilliant Pebbles Effectiveness Are Based on Many Unproven Assumptions** (GAO/NSIAD-92-91; 30 pp., no charge), by the General Accounting Office (GAO), expresses doubt about the reliability of the computer simulations that underpin the latest scheme planned for SDI, Brilliant Pebbles, a global network of hundreds of satellites constantly orbiting at altitudes of about 250 miles, and supposedly steerable into the path of incoming missiles. The GAO reports SDI and its contractors have run various simulations, including one for "an intermediate-range attack on Great Britain by Libya. It showed," the GAO says, "that all of the missiles would be intercepted by Brilliant Pebbles." GAO says the quality of the simulations will improve as the program matures, but cautions that "there is a great danger in accepting computer simulations as representing reality, rather than using them as design tools."

Order from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

## Misconduct

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directed to misconduct."

The Panel's principal legacy is a recommendation for creation of an "independent Scientific Integrity Advisory Board" that would "exercise leadership" in dealing with misconduct.

A reporter asked where the Board would be located. "We need to find a place," responded the Chairman of the Panel, Edward E. David Jr., retired industrial executive and former White House Science Adviser.

Academy President Frank Press then explained that discussions on a homebase for the Board were under way with the National Academy of Public Administration, a Congressionally chartered, Washington-based organization. Asked if there's an existing counterpart of the proposed Board in any other profession, Chairman David said he was not aware of any.

The study was financed by a group of federal agencies, several private foundations, and the Academy itself, which says it contributed \$245,200 toward the \$888,000 total. Most of the money was spent for travel expenses of the 22 panel members, who served without pay, plus salaries for three staff members.—DSG

**AWIS Magazine**, six-times-a-year publication of the Association for Women in Science (18 pp. in March/April issue), contains news, reports, interviews, book reviews, etc., related to women in scientific and technical careers. Included is a list of some 50 AWIS chapters around the country, with names of officers and addresses. Subscriptions come with AWIS membership, for which fees range from \$10 to \$55, based on income. AWIS, established in 1971, has 3700 members.

Order from: AWIS, Suite 820, 1522 K St. NW, Washington, DC 20005; tel. 1/800-886-AWIS; in Washington, DC area: 202/408-0742.

## Job Changes & Appointments

**William Harris**, Science and Technology Assistant to the Director of the National Science Foundation, has been appointed head of the NSF Directorate for Mathematical and Physical Sciences. He succeeds **David Sanchez**, who has held the post since 1990 and plans to return to Lehigh University, where he is Professor of Mathematics. Harris joined NSF in 1977 and formerly was Program Director for Physical Chemistry at the Foundation.

**Ted Berlincourt**, Director of Research and Laboratory Management at the Pentagon, says he plans to retire in October. The post he holds is responsible for most of the Defense Department's basic research programs, in house and in universities.

**Richard P. Hora**, Division Vice President and Energy Business Manager for General Dynamics Space Systems Division, has been named Chairman of the Council on Superconductivity for American Competitiveness, a Washington-based booster organization. He succeeds **George A. Keyworth II**, the former Reagan Science Adviser. Keyworth, Director of Research at the Hudson Institute, served as Chairman since the Council's founding in 1987.

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## INPRINT: R&D Budget, Future Army Technology, Etc.

*The publications listed are obtainable as indicated—not from SG&R.*

**AAAS Report XVII: Research and Development FY 1993** (340 pp., \$14.95 for AAAS members; \$18.95 for others, plus \$4 for shipping), annual review of the President's proposed R&D spending plans for the coming fiscal year and related policy trends, prepared by the American Association for the Advancement of Science (AAAS) in collaboration with 22 other professional organizations. Separate chapters, with abundant financial data, cover each federal R&D agency and the major scientific disciplines. Included, too, are analyses of basic research, industrial R&D, and science and math education. Based primarily on the budget that the President submitted to Congress in January, the report ends in midstream, since the final figures for fiscal 1993 (which begins next October 1), won't emerge from Congress until summertime. The editors acknowledge that the work is a bit on the rough side, noting that the individual chapters "have been prepared largely independently of one another and under extremely tight deadline pressure." Nonetheless, the report contains heaps of information and insights on the financing and politics of federal R&D. The report served as background material for the annual AAAS Science and Technology Colloquium, April 16-17, well-attended, as usual, by science-policy aficionados and R&D budget watchers from around the nation.

Order from (checks payable to): AAAS Books, c/o Tasco, PO Box 753, Waldorf, Md. 20604; tel. 301/645-5634.

**The Budget Process and R&D** (73 pp., no charge), by Willis H. Shapley, retired senior NASA executive and longtime R&D specialist in the old Bureau of the Budget, a basic guide to the roles of the White House, federal agencies, Congress, and outside pressure groups in R&D budgetmaking. A useful primer as far as it goes, but there's virtually nothing about the grubby underside of R&D politics, e.g., pork-barrel appropriations and deceptive pricing of mega-projects. Shapley prepared the report for the Carnegie Commission on Science, Technology, and Government, an offshoot of the philanthropic Carnegie Corporation. Other publications of the Commission are listed in the report.

Order from: Carnegie Commission on Science, Technology, and Government, 10 Waverly Place, 2d Floor, New York, NY 10003; tel. 212/998-2150.

**Good Science and Responsible Scientists: Meeting the Challenge of Fraud and Misconduct in Science** (92-135; 35 pp., \$3, plus \$2 for shipping and sales taxes as appropriate), by Albert Teich and Mark Frankel of the American Association for the Advancement of Science, a brief review of how science, politics, and the press have responded to the misconduct issue, plus customary admonitions about the importance of protecting the careers of "whistle-blowers"

and the rights of the accused. The report was prepared for the National Conference of Lawyers and Scientists, a joint forum established in 1974 by the AAAS and the American Bar Association.

Order from (checks payable to): AAAS, Directorate for Science and Policy Programs, 1333 H St. NW, Washington, DC 20005; attn. Magby; tel. 202/326-6600.

**Star 21: Strategic Technologies for the Army of the Twenty-First Century** (301 pp., \$34.95, plus \$3 for shipping), by the National Academy of Sciences Board on Army Science and Technology, a bountiful menu of technologies that it advises the Army to pursue so it can dominate any ground-based military challenge over the next 30 years. From electronics-packed "smart" helmets to gene technologies for "identification of individual persons" and directed-energy beams for zapping enemy sensors, nothing on the horizons of warfare seems to have been missed by the scores of researchers, industrial executives, and military officers who worked on this report since the Army requested it in 1988—not even weather modification, which the Army is advised to monitor as a possible military technology. Though the collapse of the Soviet threat is acknowledged, and the US is the sole remaining superpower, the authors manage to summon up new demons: "Potential adversaries throughout the world," they warn, "are surely considering how to obviate the conditions that allowed so dominating a success for US forces in the Persian Gulf war. In turn, the Army must try to anticipate and obviate these counter-strokes." The checklist of credibility and balance to which the Academy subjects its reports obviously requires an additional item: galloping paranoia. Presiding over the long study was an executive committee consisting of: Willis Hawkins (Chairman), Lockheed Corporation, retired; Robert B. Everett, The MITRE Corporation, retired; Martin A Goland, Southwest Research Institute; Ray L. Leadabrand, Leadabrand and Associates, and Michael D. Rich, the RAND Corporation.

Also from the Academy: **Automotive Fuel Economy: How Far Should We Go?** (259 pp., \$34.95, plus \$3 for shipping), by the NAS Committee on Fuel Economy of Automobiles and Light Trucks, looks at federally mandated fuel-economy standards—which have stood at a corporate average of 27.5 miles per gallon since 1985—and says improvements are technically achievable. But, it concludes that "the determination of the practically achievable levels of fuel economy is appropriately the domain of the political process, not this committee." The report also observes that "Most of the studies on the potential and prospects for improving fuel economy that were performed outside the industry and virtually all the debates in Congress on the subject have drawn on the work of one firm [Energy and Environmental Analysis, Inc., Arlington, Va]. It is inescapable

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